

REMARKS

Claims 1-7 are pending in the application. Claims 1-4 are rejected. Claims 5-7 are objected to.

Claim 5 has been amended to independent form to include the limitations of claims 1 and 3. Claim 5 is in condition for allowance. Claims 6 and 7 depend from claim 5 and are likewise in condition for allowance, which action is respectfully requested.

Claims 1-3 are rejected under 35 U.S.C. § 102 (e) as being anticipated by Azuma (U.S. 6,430,150). Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Azuma as applied to Renaudin (U.S. 4,388,715).

Azuma describes a method where information relating to a failure is transmitted throughout the network. Each node determines an alternate path to avoid the failure and the service is switched to the alternate paths.

Applicant's claims 1 and 2 are different because each describe:

cross-connecting trigger information pieces detected for the individual channel signal according to the line setting information; and

controlling the cross-connect operation of the main signal based on said line setting information and the cross-connected trigger information pieces so that one of the working channel signal and the protection channel signal is selectively output under the cross-connect operation for the main signal.

Therefore in the present invention, the cross-connecting operation is shared for both the cross-connecting operation for the main signal and for the switching operation between the working path and the protection path.

Thus the present invention as claimed, cross-connects the main signals and controls the cross-connect operation between a working path and a protection path and does not need hardware switches such as a path switch exclusive for the switching operation between the working path and the protection path in addition to a cross-connect section.

Azuma and Renaudin are totally silent of the above-described applicant's concept and in particular the recited claims features of claims 1 and 2. Therefore, it is respectfully submitted that the subject matter of amended claims 1 and 2 does not read on Azuma and Renaudin, individually or in combination.

For at least the foregoing reasons it is respectfully submitted claims 1 and 2 are different and would not have been obvious in view of the prior art. Claims 1 and 2 are in condition for allowance which action is respectfully requested.

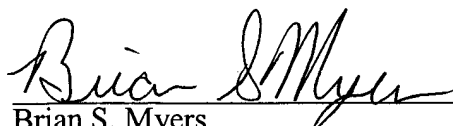
Claims 3 and 4 depend from claim 2, and should be allowed because they are dependent upon claim 2 and because they recite the additional features.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Versions with markings to show changes made."

In view of the remarks set forth above, this application is in condition for allowance which action is respectfully requested. However, if for any reason the Examiner should consider this application not to be in condition for allowance, the Examiner is respectfully requested to telephone the undersigned attorney at the number listed below prior to issuing a further Action.

Any fee due with this paper may be charged to Deposit Account No. 50-1290.

Respectfully submitted,


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Version with Markings to Show Changes Made

IN THE CLAIMS:

Claims 1, 2, 3, 5 have been amended as follows:

1.(amended) A cross-connect method for performing a cross-connect operation on a main signal including [which includes] a working channel [path-for-work] signal transmitted over a working path [for work] and a protection channel [path-for-protection] signal transmitted over a protection path [for protection], said method comprising the steps of:

retaining line setting information required for the cross-connect operation;

detecting trigger information, causing a selection of one of the working path and the protection path, for an individual channel signal from said main signal;

cross-connecting trigger information pieces detected for the individual channel signal according to the line setting information; and

controlling the cross-connect operation of the main signal based on said line setting information and the cross-connected trigger information pieces so that one of the working channel signal and the protection channel signal is selectively output under the cross-connect operation for the main signal [, said cross-connect operation being controlled in such a manner that one of the path-for-work signal and the path-for-protection signal is to be selectively output].

2.(amended) A cross-connect apparatus comprising:

a main signal cross-connect section for performing a cross-connect operation on a main signal including [which includes] a working channel [path-for-work] signal transmitted

over a working path [for work] and a protection channel [path-for-protection] signal transmitted over a protection path [for protection];

a memory section for retaining line setting information required for the cross-connect operation;

a trigger information detecting section for detecting trigger information, causing a selection of one of the working path and the protection path, for an individual channel signal from said main signal;

a trigger information cross-connect section for cross-connecting trigger information pieces detected by said trigger information detecting section for the individual channel signal according to the line setting information; and

a cross-connect control section for controlling the cross-connect operation of the main signal [, which is performed by the] cross-connect section, based on said line setting information of the memory section and the trigger information cross-connected by the trigger information cross-connect section so that one of the working channel signal and the protection channel signal is selectively output under the cross-connect operation of the main signal cross-connect section [, said cross-connect control section being configured to control the cross-connect operation, in such a manner that one of the path-for-work signal and the path-for-protection signal is to be selectively output].

3.(amended) A cross-connect apparatus according to claim 2, wherein said trigger information detecting section [cross-connect control section] includes:

an alarm detection section for detecting alarm information as the trigger box 10
information for the individual channel signal in the main signal; and

an alarm information cross-connect section for cross-connecting [performing a cross-connect operation on said] alarm information pieces, [which has been] detected by said alarm detection section, based on said line setting information retained in said memory section; and

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said cross-connect control section includes:

a switch control section for generating [a] selection information specifying which one of the working [path-for-work] signal and the protection [said path-for-protection] signal should be selected for output under the main signal cross-connect operation, based on the line setting information and the cross-connected [said] alarm information [performed] by said alarm information cross-connect section for outputting said selection information,

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said cross-connect operation for the main signal being operable to perform the main signal cross-connect operation based on said selection information output from said switch control section.

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5.(amended) A cross-connect apparatus [according to claim 3,] comprising:

a main signal cross-connect section for performing a cross-connect operation on a main signal including a working channel signal transmitted over a working path and a protection channel signal transmitted over a protection path;

a memory section for retaining line setting information required for the cross-connect operation; and

a cross-connect control section for controlling the cross-connect operation of the main signal cross-connect section, based on said line setting information so that one of the

working channel signal and the protection channel signal is selectively output under the cross-connect operation of the main signal cross-connect section,

wherein said cross-connect control section includes:

an alarm detection section for detecting alarm information in the main signal; and

an alarm information cross-connect section for cross-connecting the alarm information, detected by said alarm detection section, based on said line setting information retained in said memory section; and

a switch control section for generating selection information specifying which one of the working signal and the protection signal should be selected for output under the main signal cross-connect operation, based on the line setting information and the cross-connected alarm information by said alarm information cross-connect section for outputting said selection information,

said cross-connect operation for the main signal being operable to perform the main signal cross-connect operation based on said selection information output from said switch control section, and

wherein said cross-connect control section further includes:

a concatenation information detection section for detecting concatenation information relating to a combination of header data and subsequent data in the main signal; and

a concatenation information cross-connect section for performing said cross-connect operation on said concatenation information, which has been detected by said concatenation information detection section, in accordance with said line setting information retained in the memory section,

said switch control section being operable to generate selection information, based on said concatenation information as the result of the cross-connect operation of said concatenation information cross-connect section and said alarm information as the result of the cross-connect operation of said alarm information cross-connect section.

6. A cross-connect apparatus according to claim 5, wherein said concatenation information detection section encodes said concatenation information detected by said concatenation information detection section, and said switch control section generates said selection information, based on said concatenation information, which has been encoded by said concatenation information detection section and on which the cross-connect operation has been performed by said concatenation information cross-connect section.

7. A cross-connect apparatus according to claim 5, wherein the cross-connect control section subjects said subsequent data of said concatenation information to execute the same cross-connect control as said header data of said concatenation information.